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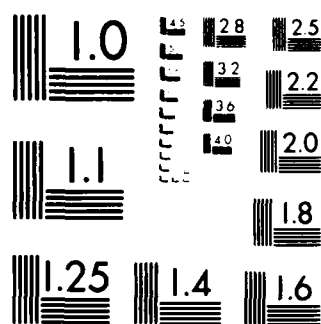
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THE 20TH INTERNATIONAL SYMPOSIUM ON  
APPLIED MILITARY PSYCHOLOGY

RICHARD E. SNOW

7 DECEMBER 1984

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## EXECUTIVE SUMMARY

The 20th International Applied Military Psychology Symposium was held 25 through 29 June 1984, hosted in Brussels by the Belgian Armed Forces. It enjoyed the largest attendance by countries since the symposium series began in 1963.

Presentations were organized under seven headings: selection using individual and group instruments; selection, classification, and job analysis; personnel systems and the organization of psychological services; adjustment to military life and stress; organizational diagnosis and intervention; evaluation of new programs; and large-scale basic research programs.

Belgium reported new studies on computer-adaptive testing, personality and social skill assessment using free-response instruments, ratings, and group problem-solving tasks. Results help explain the cognitive aspects of rating, particularly self rating, and suggest that individual free-response and group situation methods may be uniquely useful.

Portugal contributed a demonstration that group observation methods provided predictive validity in selection of students for a naval academy. Their diagnostic value was also shown.

British Royal Navy data suggest that the mental ability of its enlisted personnel is now at its highest in modern times. Trends were reported for 1950 to the mid-1980s.

Dutch research on test data used for enlisted job classification raised doubts about their usefulness. Educational data used alone may be sufficient.

Canada reported on a continuing study of women assigned to near-combat jobs and on public opinion about this assignment. Polls show definite agreement that women should serve in both peace and war, and cautious endorsement of their assignment to combat roles.

British Royal Air Force studies are attempting to improve the specification of ability requirements for navigators. Different types of aircraft call for different abilities in this critical role.

Austria has developed stress endurance tests for officer selection. Validity studies are under way.

Finland concentrates its psychological services on NCO and officer selection. The aim is to spot failures early in training rather than to predict degrees of success.

Spain has established a broad organization of psychological services and has begun studies of selection and training, mental health, and adjustment. Significant attention has been paid to the development of an ethical and regulatory code for the service.

Sweden reported the start of new studies of pilot selection. Aptitude measures, including the unique Defence Mechanism Test, will be validated against accident as well as other performance and training measures.

Switzerland reported on its unique military situation. Its entire able-bodied male population serves in regional reserve forces from age 19 to 50. Language is a special problem here. Pilots use a form of Esperanto, mixing French, German, and Italian, during flight operations.

Turkey reported studies of adjustment by new soldiers from rural versus urban backgrounds. Rural recruits show higher rates of personality disorder initially but then adjust to the rigor of military performance and command structure, as they did to the rigor and patriarchal structure of home life, to become model soldiers. Urban recruits show better initial adaptation, but display increasing frequency of disorder until after the first year, when military life becomes relatively more relaxed. In the second year, both groups appear equally well adjusted.

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Italy is studying stress among sailors stationed at isolated island bases. Relative to controls, isolated sailors show depression and personality disorders. The aim is to improve both selection procedures and environmental conditions at the bases.

US Army studies in Europe cover a range of medically related, social psychological issues. A sense-of-community scale distinguishes families that return to the US within 1 year from families that stay in Europe. During maneuvers, about half of those hospital cases sampled display stress-related symptoms and score lower on psychological well-being scales than do those with specific physical ailments.

Israel emphasized the need for interdisciplinary psychological approaches to intervention in military units. Job analysis for a selection system, for example, cannot overlook training or organizational problems. Comprehensive solutions do not come piecemeal.

West Germany is developing a unit-diagnostic tool to provide anonymous feedback to commanders on unit attitudes and job satisfaction. Feedback to comrades also has an educational effect. Studies so far include patrol boat and destroyer flotillas, and show promising results.

US Navy research on organizational interventions to increase productivity among civilian employees shows that an action research approach is always needed to adjust abstract and often simplistic theories to local conditions. Otherwise, for example, incentives that work in one department may not work in another, for contextual reasons that go unrecognized.

In The Netherlands, a new, more streamlined performance appraisal system has eliminated some problems but created some new ones. Now, with only one assessor for each assessee, tension occurs if both are NCOs or if the superior is junior to the subordinate in experience.

Canada's system for assisting retirees in starting a second career is being evaluated. While it works on an informational level, it does not yet cope well with emotional problems, especially since many retirements are involuntary. An approach that identifies different counseling treatments for different kinds of persons is being examined.

Israel's experience with educational evaluation has been sobering. Given that summary evaluations of new programs occur in a political context and rarely have the effect intended by evaluators, formative evaluation to improve existing programs is the more useful strategy.

The US Office of Naval Research is increasing its emphasis on research aimed at basic scientific theory and long-range use, rather than immediate application. Some current work seeks a precise theory of human vision to improve computer vision. Other projects expand on a componential theory of reading skill, or seek the sources of inconsistencies in decision making. The aim is to turn current descriptive models into more fundamental understanding.

NATO research programs are emphasizing deeper research into psychological fitness, collective behavior in warfare, the human engineering of man-machine performance, stress, fatigue, and the human as a limiting element in military systems. The working group on psychological fitness, in particular, is exploring basic research on writing pressure measurements, changes in performance measures under stress, and physiological and neuropsychological assessment of stability and economy in human information processing.

## THE 20TH INTERNATIONAL SYMPOSIUM ON APPLIED MILITARY PSYCHOLOGY

The 20th International Applied Military Psychology Symposium (IAMPS) was held from 25 through 29 June 1984 in Brussels, Belgium. It was hosted on behalf of the Belgian Armed Forces by General Major F. Kermer, Chief of the General Personnel Service. Local arrangements were made by Commandant Arnold Böhrer, who heads the Psychological Research Section of the Belgian Recruiting and Selection Center.

IAMPS this year enjoyed the largest attendance by countries since the symposium series began in 1963. The formal sessions, held in the Club Prince Albert, included many useful papers and lively discussion. At midweek, also, an excursion to the Belgian Naval Base at Ostende provided an introduction to research on diver selection and training at the Hyperbaric Medicine Center, and a demonstration of the bomb disposal services of the Belgian Navy.

The present report provides only a brief summary of the formal presentations. The appendix gives a complete list of participants and their addresses; readers desiring detailed information on particular points should contact individual participants directly. For this report, the presentations are organized under topic headings that do not necessarily reflect the order in which they were given at the symposium. The main topics are: selection research on individual and group instruments; selection, classification, and job analysis; personnel systems and the organization of psychological services to those systems; research on adjustment to military life and stress; organizational diagnosis and intervention; evaluation of new programs; and new emphasis in large-scale research programs for the future.

### Selection Research on Individual and Group Instruments

A. Böhrer (Belgium) led off with an overview of the main research projects of the Belgian Psychological Research

Section. Studies of computerized adaptive testing seek to improve intelligence measurement with the dual purpose of maximizing efficiency and validity while minimizing the amount of testing individuals are forced to endure. Analyses of aptitude assessment also extend into the personality and social skill domains with basic research on free response instruments, ratings of self and others, state versus trait distinctions, and group problem-solving tasks. Throughout the program, the work attempts to connect instrument improvement with understanding of the basic psychology of the instruments and with respect for the individuality of the persons with whom the instruments are to be used. Both the goals and the progress to date are indeed impressive.

First, G. De Soete (Belgium) described progress on the construction and evaluation of an adaptive screening test of intelligence for use in the Belgian Armed Forces. A nine-level pyramidal version of an intelligence test consisting of items from Cattell's Culture Fair Intelligence Test, Forms 2 and 3, was developed based on the Rasch model. A Monte Carlo study compared this pyramidal test with a maximum information adaptive test and a conventional test of the same length. It was found that both the pyramidal and maximum information adaptive test provided more information than the conventional test. Moreover, the two adaptive tests did not differ much with respect to test information.

S. Van Den Broucke (Belgium) then reported on the continuing studies of personality assessment conducted by the Psychological Research Section in cooperation with researchers at the University of Leuven. These studies have shown that a free-response self-description method, when administered ahead of conventional inventories, not only provides substantial predictive validity but seems also to increase the validity of the conventional inventories. There is much interest, therefore, in further research with such instruments.

In this presentation, the method and scoring procedures were described in

detail. The instrument simply asks respondents to reflect about themselves for a few minutes and then write down 10 adjectives that describe their personalities. The adjectives are then scored on eight dimensions: social desirability, extraversion, agreeableness, conscientiousness, neuroticism, development, leadership, and creativity. The scoring system was developed by obtaining trait ratings on each dimension from 10 trained psychologist judges on each of 2432 adjectives. Although it is possible for a respondent to produce an adjective not on this list, experience shows that at least 90 percent of the adjectives produced by respondents are on the list. When new adjectives do appear they can be omitted or translated into synonyms that are on the list. Either approach has been shown empirically justified, but the synonym method is preferred. An internal consistency study suggested that the instrument should not include less than 10 adjectives. A retest reliability study indicated an average coefficient of .45, with 6 months to 2 years intervening between tests, if the free-response assessment is administered before other inventories (and .25 if administered after other inventories). Thus, the administration order effect previously reported to influence validity seems also to influence reliability. Further studies have also shown that the dimensions scored do discriminate among groups of respondents in the Belgian Armed Forces and in civilian schools in interpretable ways. Also, there is some evidence that respondents not in a selection situation give self-descriptions that are lower on social desirability and also less favorable than do respondents in a selection situation. Thus, fakability may be an issue needing further attention.

An important next step will be to work out the cognitive psychology of this assessment technique. Especially in need of explanation are the effects on reliability and validity of administration order for the free-response instrument and conventional inventories.

L. Sanders (Belgium) next reviewed some cognitive psychological theory relevant to ratings of self and others and reported some further studies in this direction. When persons are asked to describe or rate themselves or others on personality trait dimensions, the stimulus must be compared somehow with stored memory content about the person. There seem to be three kinds of memory structures used: *role structures*, containing a label such as "officer" or "sailor," and associated features of such groups of persons; *attribute structures*, containing labels such as "extravert" or "honest" with their associated features or behavioral examples; and *person structures*, containing networks of information about particular persons, including oneself. There are also different levels of abstraction in these structures, and some are intensely interconnected to form larger schemata. When accessed, much interconnected information about a single theme or stimulus can be retrieved, almost instantly. Accessibility of information can be increased by priming with external stimuli that fit particular memory elements. Frequency of use and emotional charges also influence accessibility. Two traits may be equally applicable in some instance, but the more accessible will be retrieved. For rating a person, the whole person structure should be accessible; a frequently used person schema should be more accessible than a less frequently used schema. Also, some inferred traits may be more accessible than others because they are associated with highly accessible attributes.

The process of memory-based personality rating can be divided into three stages: *automatic processing*, that is nonconscious, fast, and rigid, accessing memory contents that fit the external stimulus in a direct, mechanical way; *conscious processing*, that involves a much slower, active search for memory contents that correspond to the stimulus, and the resolution of inconsistencies and integration of inferences into a decision; and finally *response and storage*, a stage in which a motoric



response program is triggered and the stimulus and response information is stored in long-term memory. Thus, the terms of the stimulus--for example the item "I am honest: Yes/No/Depends on the situation"--are first coded automatically and compared with the memory structures for "self" and "honest." The stimulus is understood and the activated memory structures are automatically primed for further conscious processing, if needed. Conscious processing might then be needed to consider different situations, recalled inconsistencies, and the consequences of different responses in this situation. A response is then selected based on a conscious decision, and the experience is added to the existing memory structures for future reference.

An experiment bearing on this analysis was then reported. The results correspond to the hypothesis that "yes" responses are easier to reach because the comparison of person and trait schemata yields an inference, previously stored, that fits the situation. "No" responses require extra conscious processing to resolve inconsistent comparisons. Also, negative trait items are more frequently responded to with "No," are considered more difficult to rate, with less confidence, and are less well recalled. This also conforms to hypothesis. Finally, using scores on self-consciousness and social desirability for the subjects, it was shown that persons high in self-consciousness seem to have more accessible person and attribute schemata and thus find rating easier with more confidence; they show faster response and better recall for positive but not for negative items. Those high in self-consciousness also seem less positively biased in rating both self and others.

Considering this and other research, it seems that several recommendations for personality assessment design can be reached. Some of these relate to the validity findings for the free-response method discussed by Van Den Broucke. Environmental conditions that promote private self-consciousness

may increase the ease of rating and the validity of self reports, as well as ratings of others. Priming techniques such as exposure to evaluative terms or biographical information and an individualized instrument should enhance self-consciousness and accessibility. Conceivably, the free-response format performs this function and increases valid responding to it as well as to the conventional inventories that follow it. But conventional inventories met first in a test administration activate different memory structures that are less connected to self structure, and interfere with self-awareness and valid responding on both the inventories and the following free-response instrument. Clearly, in either format, and in rating self or others, careful attention needs to be given to the wording of instructions and items, and other environmental conditions that might prime different memory structures in the rater. Rating of others needs to be based on recent and frequent interaction with these others.

Next, P. Vermeulen (Belgium) described research on the use of state as well as trait personality measures in predicting leadership measures for officers. It was felt that state measures offered improved face validity and perhaps also better prediction of criteria in a selection situation. The Spielberger instrument was used. State anxiety was measured before and after two leaderless group tasks. State anger was measured by asking subjects to imagine situations producing anger toward fellow officers and subordinates. Subjects were 112 Flemish-speaking and 78 French-speaking regular officer candidates. In brief, results showed that state anxiety measures yielded consistently high correlations (about  $-.45$ ) with leadership criteria but that state correlations were higher than trait correlations only for the French-speaking group. Anger measures did not correlate with the criteria.

Following this line, L. Van Langenhove (Belgium) reported that further work of the Psychological Research

Section in developing group situational performance tests (GSPT) for use in assessing aspects of social behavior in small groups, such as persuasiveness and leadership skills. The tasks clearly serve also as a medium within which a variety of other psychological and social phenomena can be studied.

The group problems presented can be primarily cognitive or social in content, with or without associated materials provided, and with or without assignment of specific roles to individuals in the group. One could easily extend this classification by crossing it with other dimensions--such as whether external stress is imposed on the situation, whether members of the studied group know one another, and the degree to which the situation presented is a close simulation of actual physical and social conditions. Most GSPTs also vary in the size of the group that can be accommodated and studied, the number of observers required, and the degree to which observation is obtrusive in the behavioral situation.

The GSPT approach originated in German military research between the two world wars. Leaderless group discussion was the most frequently used format; the aim was improved selection of officers. Similar techniques were then adopted for officer selection by the British Army during World War II. The Australian Army and the US Office of Strategic Services (OSS) soon followed suit. The OSS used GSPT assessment methods on a wide scale, especially for selection of espionage agents. Although military use has continued, psychological research on the technique seems to have died out by the middle 1960s. GSPT use continues to be promoted in group dynamics training and in some aspects of industrial executive selection, but also without strong accompanying research. Thus, we have a technique that is being continually used in industry and the military organizations of some Western countries and that has shown great promise in assessing the many complexities of performance *in situ*; but the technique is not well

understood by military psychologists. See ESN 38-12:603-605 (1984).

It is clear what the problems are for the use of GSPTs in selection. It is difficult to standardize such situations even with a common task across groups, because different group compositions will influence the performance of individual members. The use of confederates, which would help standardization, is expensive. No standard system of observation seems to apply equally across situations. And the situations themselves are difficult to construct in ways that bring out clearly the kind of behavior that must be assessed.

One such task now being studied in Belgium is the Role Model Area Task (ROMAT). The task is geared to provide a situation often faced by military officers in modern peacetime conditions. It seems to provide unique descriptions of persuasive and cooperative behavior between military and civilian representatives, and perhaps also can be used to assess attitudes toward the military in the civilian, or the Belgian conscript, population. ROMAT requires that five to seven group members play roles representing rural, urban, industrial and commercial, and military interests in deciding the location of new installations--such as airports, factories, army barracks, and missile sites--in a local map area. There are strict rules regarding roles, time limits, and instructions. Empirical evidence on the Belgian ROMAT has not yet been reported. But the development should be watched closely because it is among the first systematic investigations of GSPTs in modern military circumstances.

Another such investigation is proceeding in Portugal. J. Correia Jesuino (Portugal) described research using a new method for observing group interactions to assess characteristics related to naval academy performance. In recent years the academy has experienced high attrition rates due apparently to motivational factors that are difficult to assess during selection. It was thought that new procedures might help solve

this problem. The method, called SYMLOG (for Systematic Multiple Level Observation of Groups), involves a three-dimensional system associated with a 26-item adjective rating form that can be used by individuals themselves or by raters to characterize individual behavior in group interaction as well as group functioning as a whole. The dimensions are dominant vs. submissive, friendly vs. unfriendly, and instrumentally controlled vs. emotionally expressive; they are derived from extensive empirical work on small group functioning by Bales and his associates. Individuals can be located in this three-dimensional space as displaying different types of social personality. The criterion was attrition from the academy due to failure to adapt to military norms; 25 percent of the group abandoned the academy for this reason, and another 13 percent experienced academic failure.

Some important findings emerged. Three types of persons were particularly likely to drop out due to failure to adapt to norms. These were persons described as: passively alienated and unfriendly, cynical and rejecting of group task orientation (the DNB type); anxious, tense, negative to authority and to group leadership (the DB type); self-effacing, nonassertive, passive, without enthusiasm (the D type). Counting maladaptive and some academic failures, it is seen that all those subjects rated as D, DB, or DNB types actually failed, whereas the subjects with more favorable profiles who also abandoned the academy did so to pursue civil academic careers rather than because of maladaptation.

A reexamination of personality inventory scores originally collected as part of the regular selection procedure showed that the D, DB, and DNB types could not have been detected without SYMLOG. Also identified were two types of persons who seem particularly well suited for military careers, judging by their later evaluations as cadets. These were persons described as: active, dominant, talkative (the U type); and analytical, task-oriented, problem-solving

(the F type). It seems clear that SYMLOG provides a valuable selection device deserving of further research and development.

#### Selection, Classification, and Job Analysis

B.T. Dodd (UK) described the selection procedures used for Seaman ratings in the Royal Navy since 1950. A recruiting test (RT)--consisting of sections on reasoning, English, arithmetic, and mechanical knowledge, combined with an interview and medical examination--has provided the main source of information for entry decisions. Most ratings enter either as Seaman Operators or Seaman Mechanics; later specializations, in radar or sonar for example, come from the Operator group. In 1950, the minimum RT level required for entry as Mechanic was set above the median of all Royal Navy applicants and this has assured a stable quality of intake to this branch ever since; there have been only minor changes in RT or the criterion cut-off over the years. There has, however, been considerable turbulence in the ability flow into the Operator branch, and this can best be examined by indexing the proportion of entrants who exceeded the RT minimum for Mechanics but became Operators due to personal preference or the lack of sufficient places in the Mechanics branch at the time. The trend of this index from 1950 to 1984 shows marked fluctuation; a slight decline to the middle 1950s was followed by a crest in 1960 to about 75 percent and then a plunge to roughly 20 percent just after 1970--a steady increase since has resulted in close to 100 percent of the Operators exceeding the minimum score for Mechanics in the middle 1980s. Thus, contemporary British sailors are, on average, much more able in educational and mental facility than they used to be.

M. Harsveld (The Netherlands) reported an innovative experiment on the use of test scores for classification purposes. An entire bimonthly intake of over 6000 conscripts was randomly divided into two groups. For the control

group, conventional procedures for assigning conscripts to job categories using test score requirements were followed. Conscripts in the experimental group, however, were assigned without regard to test score requirements. All conscripts could also be divided into those assigned to jobs that did versus did not have test score requirements; and, for those jobs with requirements, note could be taken of whether or not the conscript's test scores actually met the requirements. Various training results and post-training performance measures served as dependent variables. It was found that conscripts meeting test requirements obtained better training results than did those not meeting requirements, but the differences were not great and applied only to the lower ranks, not to officers or NCOs. Test scores also predicted training results, but the correlations were not high. It was clear, as expected, that higher average test scores occurred among control conscripts assigned to jobs with test requirements, whereas higher scores were shown by experimental conscripts assigned to jobs without test requirements. However, there was no corresponding difference in training results. Also, the differences in training failure rates and in post-training performance were negligible. The conclusion seems to be that using test results for job assignment offers little of practical value over using only educational level alone.

R. Park (Canada) described progress in the continuing 5-year evaluation of the placement of women in previously all-male jobs in the Canadian Forces. The study began in 1980 and is scheduled for completion in 1985, when a detailed report will be available. The program has been studying the performance effectiveness issue in a variety of ways, using an adaptive, action research approach, with a wide range of tasks; there is concern for the social psychology as well as the individual psychology of effectiveness. Volunteer women have been placed in near-combat environments, including army combat service support,

noncombatant ships, aircrews for transport and search-rescue aircraft, and isolated radio and radar stations. Measures include degree of acceptance by those immediately affected, including spouses, and the detailed characteristics of the settings in which interventions take place.

Also included in the study is concern for public opinion, so national polls have been conducted in series over the 5-year period. In brief, the findings to date suggest that:

1. There is definite agreement that women should serve in both peace and war.

2. There is cautious endorsement of women in combat roles--the more educated, younger, protestant respondents are more in favor of women in combat roles than are others; females favor women in combat more than do males, who tend to favor combat support roles; and both males and females favor aircrew roles for women somewhat more than soldier or sailor roles.

3. Males are more in favor than females of including women in conscription.

4. There is increased support for conscription of women during times of international tension.

5. Marked change has occurred since World War II--a question from a 1943 poll had shown 76 percent of respondents believing then that a woman's place was in the home if she was not to be considered "loose," whereas the same question in the present poll shows only 14 percent of respondents holding that view.

E. Burke (UK) described an ability requirements-analysis technique used to identify selection tests for Royal Air Force (RAF) navigators. The need for navigators has been increasing, as have concerns about the quality of applicants. The ultimate objective of the work is a new computerized test battery valid for predicting navigator success. Despite many changes in aircraft and task requirements in recent years, there

has been little change in the selection tests. Previous validation studies suggest that only mathematical and spatial ability and table reading ability measures offer consistent prediction. An ability x task matrix is being constructed from questionnaire responses using procedures adapted from those of Fleishman and Mallam. The RAF procedure uses job descriptions written by the respondents, and then applies the Fleishman question algorithm. Respondents also specify the tasks related to different abilities. The study is still in process, but already some important differences are emerging. The speed-versus-accuracy trade-off between fast-jet and multi-engine navigators is one example. Another is the different emphases put on time-sharing ability, instrument scanning, and prioritization of actions by these two groups.

#### Personnel Systems and the Organization of Psychological Services

Representatives from several countries provided descriptions of the particular character of their military personnel systems and the main roles played by military psychology services in them.

E. Frise (Austria) described the selection system used for officers in the Austrian Armed Forces. A recent change to a militia-type structure for area defense has placed career and reserve officers on the same status level and required a revision of the selection procedures to apply to both. A new test has been developed to be administrable in barracks in small groups and scorable by electronic processing. About 1000 to 1500 officer candidates are tested within 1 or 2 weeks after 9 months of military service. The test covers three areas: intellectual ability, endurance under stress, and personality. The ability tests include items reflecting fluid intelligence, pattern recognition, memory, verbal comprehension and language proficiency, and spatial visualization.

Stress endurance is assessed in three ways. Intelligence tests are administered immediately after a learn-

ing task assignment and performance is compared with conventionally administered tests. A series of parallel ability tests is administered at intervals through a sleepless night. Two parallel tests are administered before and immediately after a day of stressful work, without break for sleep, and after a forced march with equipment. The personality inventory is also included in this final test to reflect the factors of introversion, anxiety, sensitivity, dependence on others, intolerance, nondirectiveness, and aggression. The procedure has been used for 3 years. A follow-up study of officer performance is planned now by the Military Psychology Section.

In Finland, as described by L. Nurmi, (Finland), all males between age 17 and 60 are liable for military service, and must serve 8 months as conscripts at about age 20. Thus, there are about 38,000 conscripts, 7000 regulars, and 700,000 trained reserves, at any one time. Intelligence and personality measures are routinely used at the conscript level and scored and interpreted by computer. The active role for military psychologists is in the selection of regular NCOs and officers from the conscript ranks and in special selection problems, such as pilots, paratroopers, divers, and technicians. Psychological assessments include educational records and ability measures but also measures of stress-coping, leadership potential, and attitude. The primary emphasis is on weeding out potential failures rather than predicting degrees of success, and on doing so in earlier rather than later phases of training.

The Psychology Service of the Spanish Armed Forces was founded in 1977. A. Velez Catalán and J. Puente Ontanilla (Spain) reported on its activities and responsibilities to date and on the development of an operational and ethical code for the performance of the service, including regulations governing the protection of confidential information. There are two basic parts of the organization. The Psychology and

Psychotechnic committee is charged with surveying the psychological needs of the Armed Forces and planning modifications in the regulations and plans governing the psychology service to improve the performance of its duties. It also approves the running of training courses and the standardization of psychometric and sociometric techniques for various uses. The actual performance arm of the service is divided into four echelons ranging from the psychologists working directly in training and drill centers, through regional command centers, up to a central office. Activities so far include studies of psychological techniques to be adapted for military use, the design of seminars and research projects on military problems, the development of training in applied psychology, and the establishment of up-to-date relations with civil and similar military organizations both at home and abroad. Objectives for future work of the Service include studies of mental health and adaptation in the Armed Forces, improvement of selection and training procedures, including teacher training, and studies of work dissatisfaction, attitudes and training for command, awards and punishments, interpersonal relations, unit assessment, communication, and ergonomics.

Carlsson (Sweden) described the relatively small psychological research group working in the Swedish Army and Air Force, and then reviewed current work in pilot selection as an example. The Swedish Air Force accepts only about 3 percent on average of the pilot applicants. Since 1970, a six-step selection procedure has been used. Recruitment uses paper and pencil tests, aptitude tests, and a psychological interview are coordinated to make a preliminary decision. Then the Verbal Mechanism Test, which provides psychodynamically-based interpretations aimed at detecting accident proneness, and a general board examination are used to make a final decision. Basic flight training and operational training then follow. There have not until now been

so a principal activity at present is to conduct such studies. One study has examined training success. An attempt is being made to identify measures of ability, motivation, and interest that might reflect how well trainees can use their psychological resources in critical situations. There is also now an accident board working on several studies that include psychologists; it is not an easy accomplishment to get psychologists into such boards--they must be accepted by the other board members as well as the organization. It is hoped that criterion information can be gotten from this source as well as from training performance.

F. Stoll (Switzerland) described the situation in the Swiss Army and Air Force, which differs in some important ways from the situations faced in other countries. In Switzerland, all able-bodied males are subject to conscription and serve in some capacity until age 50. About 84 percent of the potential population of conscripts actually start each year; the total force is about 600,000. Screening procedures for basic soldiers emphasizes medical and physical fitness. Psychological assessments are by interview. At age 19, the conscript spends 1 day in the draft procedure. At age 20, as a recruit, there are 4 months of training. From age 21 to 32, he becomes an elite soldier, spending 3 weeks in training eight times during this period. From age 33 to 40, he is a landwehr soldier, reporting for 2 weeks of training three times during this period. From age 41 to 50, he is a landsturm soldier with 4 weeks in training twice during this period. Thus, the typical soldier spends about one full year of his life, from age 19 to 50, in the army. For an NCO, about 6 months more is added across his life; much more time is added for officers. There are also specialties, of course, that require extra training. Since the army is thus wholly a reserve force, it is distributed for service across 14 regions of the country. Soldiers are assigned to regions based on the yearly requirements of each regional commander, in each branch of the force;

personal requests and family tradition are also considered. Language is a special problem, since there are four major language groups in Switzerland and many local dialects. In the army, superiors are required to speak the native language of subordinates. In the air force, which numbers 250 jets, pilots speak a kind of Esperanto mixture of French, German, and Italian.

#### Adjustment to Military Life and Stress

The presentation by K. Aydinalp and Ü Söylemezoglu (Turkey) concerned recent studies of differences in adjustment to army life exhibited by soldiers coming from rural versus urban cultures. There is a marked contrast in Turkish society between these two large populations. In the rural population, individuals typically live in extended patriarchal families in small isolated villages with limited outside contact. Traditional customs are maintained in stable and unchanging life patterns. Young persons can count on multiple mothers for guidance; there is little frustration or anxiety. Obedience to paternal authority, strength, silence, endurance, and courage are emphasized and rewarded. In the nuclear families of the urban population, however, child-rearing practices and the conditions of life are not much different than they are in other Western industrialized societies. Young persons here are likely to be more active, mobile, independent, and adaptive to changing or unfamiliar conditions. Soldiers coming from these two populations can be expected to differ substantially in psychological factors related to adaptation to military life and performance.

The study applied measures of defense mechanisms, anxiety, and depression to compare groups of soldiers from each population after 1 to 3, 7 to 8, 11 to 12, and 16 to 17 months of military service. The trends for each measure were similar and reflected striking differences for rural and urban soldiers. The rural soldiers show higher defense, depression, and anxiety dis-

order initially, presumably because they have difficulty adapting to new situations; but adjustment improves systematically over time as identification with the commander and group norms grows. The traditional character and religion of the rural recruit ultimately provides, after this adjustment, a model soldier. Those recruits from urban backgrounds show better initial adjustment, but growing frequencies of disorder are evident until the first year of military life is completed. Group identification for these men is insufficient to provide support against the growing stress and rigor of military life. After the first year, leaves of absence are available and the end of military service is foreseeable; the urban soldiers then reach again a low level of disordered reaction comparable to the level that rural soldiers have achieved.

M. Stracca (Italy) addressed the special stresses involved in military service in isolated duty stations, which may be associated not only with observably lowered morale and performance effectiveness, but also with higher rates of drug abuse, of mental and physical health problems, and even of suicides. The Italian Navy faces this problem because its defense network includes many small bases on isolated islands. Recent research compared three experimental groups of conscripts from three relatively comparable island stations with a control group of similar sailors who served in a mainland base. The perception and effects of features in isolated situations was the focus. Measures included group discussions, semantic differentials, and self-report scales reflecting anxiety, curiosity, aggressiveness, depression, and psychosomatic disorder.

Results showed quite different situational perceptions for the isolated groups relative to controls. Isolated sailors tended to be more negative, particularly on semantic differential scales defined as "gloomy," "uncomfortable," "unsatisfactory," "boring," and "tiring." Isolated sailors also showed

lower curiosity and more depression and psychosomatic disorders than did controls. Two of the isolated groups also showed higher anxiety and aggressiveness than did the controls; one isolated group, which had access to an allied base, showed less anxiety and aggressiveness. In general, it was observed that individuals in isolated groups reacted emotionally to their conditions of service rather than showing realistic awareness of the difficulties or attempting to mould or improve upon them. Continuing work aims at improving both the selection procedures for such duty stations and the environmental conditions in them.

S. Rock (US) reviewed the research program on the social psychology of medically related issues of the US Army in Europe. A list of research reports is available on request, covering such topics as battle stress reactions, endurance in continuous operations, drug abuse and its prevention, cohesion, stress and social support, integration and socialization of new lieutenants, and family adjustment problems.

Two example studies were reported. In a study of family adjustment, a "sense of community" scale (PSC) was used to divide respondents into high and low PSC groups. Marked differences were noted in the percentages of families in each group who returned to the US prior to completing a full year in Europe (24 percent for low PSC; 5 percent for high PSC), who thought that the husband should stay in the military (16 percent for lows; 27 percent for highs), who thought new families were properly greeted (39 percent for lows; 79 percent for highs), or who thought that sexual harassment was a serious problem (56 percent for lows; 28 percent for highs). In a study of stress during special maneuvers, 111 individuals were sampled for interview from a total of 427 hospitalized during the operation. Of these, 56 had complaints that might be associated with stress in one way or another. As a group, these stress patients scored lower on a scale of general psychologi-

cal well-being than did other patients, such as those with broken limbs, etc.

#### Organizational Diagnosis and Intervention

S. Sheppes (Israel) emphasized the need for interdisciplinary psychological approaches to intervention in military units. Only rarely is it possible to pinpoint a real problem and solve it with intervention through a single psychological discipline. The much more likely case is that an apparent problem relates to or reflects several other problems; this requires that problems be analyzed from several viewpoints and that coordinated solutions be designed with all aspects of the problem in view. At the least, a military psychology unit needs to include the specialties of selection, training, organizational psychology, human engineering, and clinical psychology, and must be able to bring these into coordinated focus. One example from recent Israeli military psychology experience shows why this is needed. The unit was asked to develop a new selection system for new officers. A job analysis was performed, a new system was developed and installed, and observations and interviews showed that it was indeed an improvement. But the observations and interviews also showed other problems of new officers on the job, especially in the area of organizational planning. This had escaped the job analysis. Thus, proposals for the design of on-the-job training and also for the development of an organizational survey were formulated. The selection system and training plans were accepted, but the organizational survey was rejected. Much later, after the selection and training programs proved effective, the commanders were willing to turn attention to organization and accepted the proposal for the survey. But these were all parts of the same problem and should have been recognized as such from the outset. In short, is difficult and usually impossible to develop comprehensive solutions piecemeal.



M. Flach (West Germany) described a leadership and Information Feedback System (FIRS) which is being developed as a unit-diagnostic tool. The first exploratory study was conducted on four patrol boats of the German Navy. A new and larger study is now planned to be carried out in a destroyer flotilla. This will involve about 1200 enlisted personnel. The method involves a standardized job descriptive questionnaire to reflect various aspects of job satisfaction. The instrument yields quantitative statements about satisfaction with specific work aspects; personal data and attitudes are also collected. The aim is to provide anonymous feedback to unit commanders on their unit values in comparison with reference group values, broken down by rank. Feedback is also given to individual respondents in the unit, in the hope that comparisons with comrades will provide a kind of educational effect; this is done in small groups without superiors present, so that discussion can focus on causes and problem solving. In addition to comparisons with other units, it is hoped that longitudinal comparisons among the periodic data collections within a unit will allow study of attempts at improvement, changes in leadership, etc. Data can also be aggregated to examine larger organizational units, so long as anonymity is strictly preserved. Such data may provide an early warning system on motivation and morale for commanders at various levels. Although the draft questionnaire has stood well as a diagnostic tool so far, it is not yet regarded as in final form. Consideration is being given to adding some questions, and to creating a separate assessment by unit commanders and other officers and NCOs.

R. Penn (US) discussed organizational interventions to improve productivity and the factors that lead to success and failure of these in different situations. A review of currently available scientific theories that might provide bases for such organizational interventions shows that, while at least 32 distinguishable theories exist, they

vary markedly in both estimated scientific validity and estimated usefulness. Furthermore, most of the theories typically deemed valid and useful are individualistic, rationalistic, static, and rather simple in terms of the number of variables included in the model. They are routinely assumed to be culturally independent. They also typically lack any specification of the operations required for implementing them. Thus, while they may be useful in some abstract sense, they are not really usable in Penn's view.

In contrast to the theories, the actual interventions must take place in complex multivariable systems which are context and culturally dependent in profound ways. If one reviews several instances in which some organizational intervention was tried, different results might well be expected, depending on variables important in context but left out of the theories. Work on organizational interventions and productivity among the 300,000 civilians who work for the US Navy provides some clear examples. For instance, an intervention that established incentive pay based on Vroom's expectancy theory worked well in keypunch operator departments and also in supply departments. But it failed in air-engine-repair departments where the cultural, political, and management context created conflicts over the incentive program; there were also many unexpected spin-offs. The lesson is that theories are rarely usable. What is still needed is an action research model that allows a dynamic, systems view of any intervention situation and that is interdisciplinary enough to use that view intelligently in particular contexts.

#### Evaluation of New Programs

B. Albers (Netherlands) discussed work on improving the system of performance appraisals used for selection, promotion, and training decisions. Under the old system used in The Netherlands, performance assessments were conducted by the officer (not lower than lieutenant) who was the immediate superior of

the person rated and also by this officer's immediate superior; the assessment focused on leadership and cooperation. A new system then came into effect which involved several changes. Now all regular personnel are assessed with one common system based on a new and more detailed list of aspects of performance defined in behavioral terms. The single assessor would be the functional superior of an individual without regard to rank. The system was designed to be more open, with frank discussion between assessor and assessee, and a new procedure for handling objections by the assessee was included. An investigation of the new system is now seeking to evaluate it and suggest further improvements. Using questionnaires and interviews of some 400 respondents, the study has also sought to connect findings to information on work conditions, training and guidance, and career policy. The new assessment list is favorably received and is regarded as more positive in tone than the old list, although not all terms are considered well enough defined. Discussions between assessor and assessee have indeed been more open. The objection procedure works well; only eight of 400 respondents actually raised objections about their assessments, although the questionnaire results would predict that 15 percent would raise objections. There are, however, notable tensions between assessor and assessee, particularly if both are NCOs or the assessee is an experienced NCO and the assessor is a new officer. One clear recommendation is that more than one person must be used as assessor of an individual; using only one assessor seems not good either for the persons involved or the organization.

E. Zeppek (Canada) described the Second Career Assistance Network (SCAN) developed by the Canadian forces to help retiring service persons in their transition to civilian careers. It delivers career information and provides counseling intervention. Although the program appears effective and helpful as far as it goes, there are problems needing research. Canada has an all-volunteer

force; most volunteers are career oriented, so many retirements are involuntary. The transition to civilian life can pose substantial personal problems that are not solved by providing career information and counseling. The evaluation suggests that SCAN is probably already overly cognitive and rationalistic; it ignores the noncognitive needs and reactivity of the individual to the impending change. More and better high technology input to the retiree is thus probably not the answer. Rather, one needs to take a person  $\times$  situation interaction view. One person variable worth considering is Rotter's internal versus external locus of control. It appears that the internally controlled person is more active and skilled in information search and more tolerant of frustration, whereas the externally controlled person is more susceptible to alienation and hopelessness. SCAN may work better for more internally controlled persons, but other kinds of interventions seem to be needed, in addition to or instead of SCAN, for more externally controlled persons. There are also other person variables that might be investigated as aptitudes for different kinds of career transition treatments. It would be useful also to have a survey of how other countries deal with problems in this area.

A. Spector's (Israel) report reviewed some lessons learned in evaluating instructional programs within the Israeli Defense Forces. Military psychologists need to understand what educational evaluations are, what purposes they serve for different publics, and how to conduct them intelligently and gain from them useful outcomes. In short, Spector recommends reading L.J. Cronbach's recent books on this topic.

His example shows some of the hazards. During one period, it was believed that education was a most important function for the Israeli Army; it should educate draftees for the army and for society, and this was particularly important for draftees with otherwise low educational backgrounds. A program was established to give 2 months

of instruction in language, history, and related topics to soldiers with low educational backgrounds at the start of their service. Newspapers and TV reports claimed the program was a fantastic success in improving these persons as soldiers. Then, an evaluation study was conducted to document these claims. It studied matched groups of soldiers who participated in the program or were eligible but did not participate, or were in either of two other control groups, on a variety of behavioral measures of concern to the army, such as AWOLs, desertions, and prison records. The results showed rather minor effects of the program, an outcome that was not popular with the education corps and led to substantial criticism of the researchers who had conducted the study. Other, more descriptive studies were then done to look for effects, for example, on attitude toward military service. Pre-post results showed more positive-to-negative attitudinal change than negative-to-positive change. But the research had no effect on the program until new commanders with no prior ego-involvement in the program did use the results to make some changes.

Some generalizations that seem to emerge from this experience are: (1) decisions are political, and not likely to be based on research results; (2) unpopular results do not stop programs and can instead lead to denunciation of the researchers; (3) all this disappoints inexperienced researchers who are typically naive about evaluation and about the powers and limits of measurements in it anyway. Current work in evaluation of training techniques now takes a formative approach, attempting to improve instruction programs in place, rather than an approach that aims at summative decisions about programs.

#### New Emphases in Large-Scale Research Programs

M. Tolcott (US) described recent changes in the Office of Naval Research (ONR) research programs that increase their emphasis on basic scientific theory and long-range use, rather than

more immediate application. As one example, earlier work on perception in relation to visual display design concentrated on describing visual performance capabilities in relation to engineering design features. The aim was to improve display design using descriptive behavioral models. Now, however, research is more concerned with developing fundamental theories that explain why such behavior occurs. The projects focused here are developing mathematically precise theories of vision that can ultimately provide computer programs for artificial vision. Some concern the integration of spatial information from shading, texture, and surface contours. Some examine how three-dimensional configurations are derived from two-dimensional image motion. All combine computer modeling and psychophysical experimentation, and relate also to neurophysiological theories of vision.

Other research in learning, memory, and cognition has been concentrating on theories of skill and its acquisition, particularly in areas related to complex problem-solving and decision-making situations. One line of studies, for example, has produced a componential theory of reading skill. This has led, in turn, to the development of training games focused on components of skill that successfully improve particular skills, as well as overall reading ability. Another new line of work on decision making is studying the role of perceived causality in diagnostic inference and the causes of inconsistency in decisions. One hypothesis here is that the mechanisms underlying cognitive inconsistencies may be similar to those underlying perceptual illusions. This work, also, pursues the "why" questions that came out of earlier ONR research on descriptive models of decision making.

H. Aschenbrenner (West Germany) described the activities of North Atlantic Treaty Organization (NATO) Panel VIII concerning personnel and training research. The research study group on psychological fitness aims at developing selection methods to identify stress-resistant persons and training methods

to improve psychological fitness of all military personnel. An ultimate need is a general NATO measure of psychological fitness. It is not clear at this point, however, how best to partition this complex concept. There are cognitive, conative, and affective components, as well as biological aspects, concerned with effective performance in hostile, stressful, and deprived environments. It seems clear that assessment procedures will need to be process-based rather than static; idiographic methods may be necessary. The training problem is similarly complex; it is at least clear that training must have a strong motivational component.

Another working group addresses the problems of collective behavior in modern warfare, particularly reactions to crisis situations and their management. It is proposed also to create a working group on stress, fatigue, and sustained battle. Tied in with these efforts is the Symposium on Motivation and Morale in NATO Forces, held in Brussels in May 1984; the proceedings are now available. Another symposium has been proposed, on transfer of training to military operational systems, a topic all too often ignored in assessing training programs. Still another, on computer-based instruction in military environments, has also been proposed. A seminar on the human as a limiting element in military systems has also been held. All these activities cover related facets of the general problems attacked by this panel.

There is also an attempt to coordinate with the human engineering side of man-machine performance. The personnel selection and training side and the engineering side of system development needs to be better coordinated. A working group with this focus has also been proposed.

Finally, joint efforts have been mounted by the NATO countries to prevent alcohol and drug abuse. The situation differs in each country; the effects, however, are universally negative. Coordination of effort should be mainly in the area of training.

It is possible that a new NATO panel dealing exclusively with psychological and social aspects of military problems can be established. This would advance work on these problems, given that Panel VIII has been concerned for most years since its establishment with biomedical problems exclusively.

H. Aschenbrenner (West Germany) also contributed a paper giving more detail on the progress and plans of the NATO project on psychological fitness. (This paper was presented at the 19th IAMPS in 1983 but inadvertently omitted from ONR, London, conference report C-13-83.) The research study group on psychological fitness (PF) has sought to analyze and evaluate the available methodological approaches for measuring PF, the job analysis approaches that are needed to assess stress factors on the operator, and the methods of selection and training that would maximize operator PF. The countries active in this study group include Belgium, Canada, Denmark, France, West Germany, The Netherlands, Norway, the UK, and the US; Greece participates as an observer.

Early phases of the work involved establishing definitions of PF and its relations and constituents. PF is taken to refer broadly to the short-term and long-term psychological factors that lead to task accomplishment at a particular moment, given the necessary skills, abilities, and training. It is thus a complex including motivational, volitional, and action control factors as well as persistence and endurance under difficult conditions and the elimination of non-task-relevant action tendencies. The ability to learn new patterns of performance under changing and stressful conditions has also been recognized as an important component of PF. Related terms defined in the research include mental stress and strain, mental fatigue, monotony, flagging vigilance, and mental saturation. As noted previously, the work of the group thus relates also to other NATO activities in the areas of motivation and morale, crisis management, aircrew selection, the ergonomics of difficult or unusual environments,

and research on the human as a limiting factor in military systems in general.

A survey of available measurement and job analysis methodologies has been conducted. It is clear that PF measurement requires realistic simulation of combat condition--a difficult task in peacetime. There are however some available approaches. Three that are being focused upon by the study group are: writing pressure analyzed in longitudinal sections; an ergopsychometric approach to the study of athletic performance; and a psychophysiological and neuropsychological approach to stability and economy in human information processing.

Work on the writing pressure measurement suggests that the pressure course and amplitude dynamics of writing appear to be person-specific, allowing typological classification. The test thus appears suitable for the diagnosis of personal changes that may underlie changes in readiness to perform.

The ergopsychometric approach uses mental and psychomotor tests (e.g., pursuit-rotor and expander pulling tasks) to examine increases and decreases in capacity as a function of stress load changes among trained and untrained athletes. These measures appear to identify so-called "training champions"--those who consistently excel in training but fail in competition. The research suggests that approach motivation increases as a critical event draws near in some persons but decreases in others. Those showing increases maintain high motivation after the event, whereas those

showing decreases lose motivation after the event; in this latter group there are corresponding reductions in efficiency at ergopsychometric tasks under stress conditions, whereas performance efficiency increases for those maintaining high motivation. Current studies are investigating these measures in a group of pilots and also attempting to connect measured changes to physiological measures of activation. Included in the work also is an attempt to modify decreases in performance under stress by means of self-control techniques.

The neuropsychological approach connects with the above. The research analyzes the course dynamics of cortical direct potentials, particularly changes and times of recovery between signal pick-up, signal conversion, and preparatory impulses. The theory behind the work concerns reserve information processing capacities which appear to be task specific resources for stabilization of performance. Stability is defined as a state that permits adequate performance reaction to signals of different complexity. When predictions of this state based on simple capacity models fail, it is inferred that several different resources are at work. It is not yet clear how well the system will work for operators in complex situations.

In short, NATO Panel VIII is pursuing a range of basic studies on the PF problem. It is also attempting to connect this work with its other activities. Increased coordination among problems is thus expected.

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